front; neck rather short, thick; body short, ovate. Feet short, moderately stout; tibia bare below, with narrow transverse scutella before and behind; tarsus short, anteriorly covered with broad scutella; toes very small, the first extremely short and free, unless at the base; middle toe slightly longer than outer; anterior toes united by deeply emarginate webs. Claws long, compressed, slightly arched, rather obtuse. Plumage moderately full, soft, and blended; wings extremely long, and very narrow; primary quills excessively long, the first longest; secondaries short. Tail of moderate length, deeply forked, of twelve feathers. Tongue short, triangular, tapering; œsophagus wide; stomach rather small, oblong, muscular, the cuticular lining dense, with nine broad longitudinal rugæ; intestine rather long, narrow; cœca very small; cloaca large, globular; the digestive organs are precisely similar to those of the Terns and smaller Gulls.

BLACK SKIMMER OR RAZOR-BILLED SHEARWATER.

† *RHYNCHOPS NIGRA*, *Linn.*

PLATE CCCCXXVIII.—MALE.

This bird, one of the most singularly endowed by nature, is a constant resident on all the sandy and marshy shores of our more southern States, from South Carolina to the Sabine river, and doubtless also in Texas, where I found it quite abundant in the beginning of spring. At this season parties of Black Skimmers extend their movements eastward as far as the sands of Long Island, beyond which however I have not seen them. Indeed in Massachusetts and Maine this bird is known only to such navigators as have observed it in the southern and tropical regions.

To study its habits therefore, the naturalist must seek the extensive sand-bars, estuaries, and mouths of the rivers of our Southern States, and enter the sinuous bayous intersecting the broad marshes along their coasts. There, during the warm sunshine of the winter days, you will see thousands of Skimmers, covered as it were with their gloomy mantles, peaceably lying beside each other, and so crowded together as to present to your eye the appearance of an immense black pall accidentally spread on the sand. Such

times are their hours of rest, and I believe of sleep, as, although partially diurnal, and perfectly able to discern danger by day, they rarely feed then, unless the weather be cloudy. On the same sands, yet apart from them, equal numbers of our Black-headed Gulls may be seen enjoying the same comfort in security. Indeed the Skimmers are rarely at such times found on sand or gravel banks which are not separated from the neighbouring shores by some broad and deep piece of water. I think I can safely venture to say that in such places, and at the periods mentioned, I have seen not fewer than ten thousand of these birds in a single flock. Should you now attempt to approach them, you will find that as soon as you have reached within twice the range of your long duck-gun, the crowded Skimmers simultaneously rise on their feet, and watch all your movements. If you advance nearer, the whole flock suddenly taking to wing, fill the air with their harsh cries, and soon reaching a considerable height, range widely around, until, your patience being exhausted, you abandon the place. When thus taking to wing in countless multitudes, the snowy white of their under parts gladdens your eye, but anon, when they all veer through the air, the black of their long wings and upper parts produces a remarkable contrast to the blue sky above. Their aerial evolutions on such occasions are peculiar and pleasing, as they at times appear to be intent on removing to a great distance, then suddenly round to, and once more pass almost over you, flying so close together as to appear like a black cloud, first ascending, and then rushing down like a torrent. Should they see that you are retiring, they wheel a few times close over the ground, and when assured that there is no longer any danger, they alight pell-mell, with wings extended upwards, but presently closed, and once more huddling together they lie down on the ground, to remain until forced off by the tide. When the Skimmers repose on the shores of the mainland during high-water, they seldom continue long on the same spot, as if they felt doubtful of security; and a person watching them at such times might suppose that they were engaged in searching for food.

No sooner has the dusk of evening arrived than the Skimmers begin to disperse, rise from their place of rest singly, in pairs, or in parties from three or four to eight or ten, apparently according to the degree of hunger they feel, and proceed in different directions along parts of the shores previously known to them, sometimes going up tide-rivers to a considerable distance. They spend the whole night on wing, searching diligently for food. Of this I had ample and satisfactory proof when ascending the St. John river in East Florida, in the United States schooner Spark. The hoarse cries of the Skimmers never ceased more than an hour, so that I could easily know whether they were passing upwards or downwards in the

dark. And this happened too when I was at least a hundred miles from the mouth of the river.

Being aware, previously to my several visits to the peninsula of the Floridas and other parts of our southern coasts where the Razor-bills are abundant, of the observations made on this species by M. LESSON, I paid all imaginable attention to them, always aided with an excellent glass, in order to find whether or not they fed on bivalve shell-fish found in the shallows of sand-bars and other places at low water; but not in one single instance did I see any such occurrence, and in regard to this matter I agree with WILSON in asserting that, while with us, these birds do not feed on shell-fish. M. LESSON's words are as follows:—"Quoique le Bec-en-ciseaux semble défavorisé par la forme de son bec, nous acquies la preuve qu'il savait s'en servir avec avantage et avec la plus grande adresse. Les plages sabloneuses de Peuce sont en effet remplies de Mactres, coquilles bivalves, que la marée descendente laisse presque à sec dans des petites mares; le Bec-en-ciseaux très au fait de cet phénomène, se place auprès de ces mollusques, attend que leur valves s'entrouvrent un peu, et profite aussitôt de ce mouvement en enforçant la lame inférieure et tranchante de son bec entre les valves qui se reserrent. L'oiseau enlève alors la coquille, la frappe sur la grève, coupe le ligament du mollusque, et peut ensuite avaler celui-ci sans obstacle. Plusieurs fois nous avons été témoins de cet instinct très perfectionné."

While watching the movements of the Black Skimmer as it was searching for food, sometimes a full hour before it was dark, I have seen it pass its lower mandible at an angle of about 45 degrees into the water, whilst its *moveable* upper mandible was elevated a little above the surface. In this manner, with wings raised and extended, it ploughed as it were, the element in which its quarry lay to the extent of several yards at a time, rising and falling alternately, and that as frequently as it thought it necessary for securing its food when in sight of it; for I am certain that these birds never immerse their lower mandible until they have observed the object of their pursuit, for which reason their eyes are constantly directed downwards like those of Terns and Gannets. I have at times stood nearly an hour by the side of a small pond of salt water having a communication with the sea or a bay, while these birds would pass within a very few yards of me, then apparently quite regardless of my presence, and proceed fishing in the manner above described. Although silent at the commencement of their pursuit, they become noisy as the darkness draws on, and then give out their usual call notes, which resemble the syllables *hurk, hurk*, twice or thrice repeated at short intervals, as if to induce some of their companions to follow in their wake. I have seen a few of these birds glide in this manner in search of prey over a long salt-marsh bayou, or inlet, following the whole of its sinu-

osities, now and then lower themselves to the water, pass their bill along the surface, and on seizing a prawn or a small fish, instantly rise, munch and swallow it on wing. While at Galveston Island, and in the company of my generous friend EDWARD HARRIS and my son, I observed three Black Skimmers, which having noticed a Night Heron passing over them, at once rose in the air, gave chase to it, and continued their pursuit for several hundred yards, as if intent on overtaking it. Their cries during this chase differed from their usual notes, and resembled the barkings of a very small dog.

The flight of the Black Skimmer is perhaps more elegant than that of any water bird with which I am acquainted. The great length of its narrow wings, its partially elongated forked tail, its thin body and extremely compressed bill, all appear contrived to assure it that buoyancy of motion which one cannot but admire when he sees it on wing. It is able to maintain itself against the heaviest gale; and I believe no instance has been recorded of any bird of this species having been forced inland by the most violent storm. But, to observe the aerial movements of the Skimmer to the best advantage, you must visit its haunts in the love season. Several males, excited by the ardour of their desires, are seen pursuing a yet unmated female. The coy one, shooting aslant to either side, dashes along with marvellous speed, flying hither and thither, upwards, downwards, in all directions. Her suitors strive to overtake her; they emit their love-cries with vehemence; you are gladdened by their softly and tenderly enunciated *ha, ha*, or the *hack, hack, cae, cae*, of the last in the chase. Like the female they all perform the most curious zigzags, as they follow in close pursuit, and as each beau at length passes her in succession, he extends his wings for an instant, and in a manner struts by her side. Sometimes a flock is seen to leave a sand-bar, and fly off in a direct course, each individual apparently intent on distancing his companions; and then their mingling cries of *ha, ha, hack, hack, cae, cae*, fill the air. I once saw one of these birds fly round a whole flock that had alighted, keeping at the height of about twenty yards, but now and then tumbling as if its wings had suddenly failed, and again almost upsetting, in the manner of the Tumbler Pigeon.

On the 5th of May, 1837, I was much surprised to find a large flock of Skimmers alighted and apparently asleep, on a dry grassy part of the interior of Galveston Island in Texas, while I was watching some Marsh Hawks that were breeding in the neighbourhood. On returning to the shore, however, I found that the tide was much higher than usual, in consequence of a recent severe gale, and had covered all the sand banks on which I had at other times observed them resting by day.

The instinct or sagacity which enables the Razor-bills, after being scattered in all directions in quest of food during a long night, often at great distances

from each other, to congregate again towards morning, previously to their alighting on a spot to rest, has appeared to me truly wonderful; and I have been tempted to believe that the place of rendezvous had been agreed upon the evening before. They have a great enmity towards Crows and Turkey Buzzards when at their breeding ground, and on the first appearance of these marauders, some dozens of Skimmers at once give chase to them, rarely desisting until quite out of sight.

Although parties of these birds remove from the south to betake themselves to the eastern shores, and breed there, they seldom arrive at Great Egg Harbour before the middle of May, or deposit their eggs until a month after, or about the period when, in the Floridas and on the coast of Georgia and South Carolina, the young are hatched. To these latter sections of the country we will return, reader, to observe their actions at this interesting period. I will present you with a statement by my friend the Rev. JOHN BACHMAN, which he has inserted in my journal. "These birds are very abundant, and breed in great numbers on the sea islands at Bull's Bay. Probably twenty thousand nests were seen at a time. The sailors collected an enormous number of their eggs. The birds screamed all the while, and whenever a Pelican or Turkey Buzzard passed near, they assailed it by hundreds, pouncing on the back of the latter, that came to rob them of their eggs, and pursued them fairly out of sight. They had laid on the dry sand, and the following morning we observed many fresh-laid eggs, when some had been removed the previous afternoon." Then, reader, judge of the deafening angry cries of such a multitude, and see them all over your head begging for mercy as it were, and earnestly urging you and your cruel sailors to retire and leave them in the peaceful charge of their young, or to settle on their lovely rounded eggs, should it rain or feel chilly.

The Skimmer forms no other nest than a slight hollow in the sand. The eggs, I believe, are always three, and measure an inch and three quarters in length, an inch and three-eighths in breadth. As if to be assimilated to the colours of the birds themselves, they have a pure white ground, largely patched or blotched with black or very dark umber, with here and there a large spot of a light purplish tint. They are as good to eat as those of most Gulls, but inferior to the eggs of Plovers and other birds of that tribe. The young are clumsy, much of the same colour as the sand on which they lie, and are not able to fly until about six weeks, when you now perceive their resemblance to their parents. They are fed at first by the regurgitation of the finely macerated contents of the gullets of the old birds, and ultimately pick up the shrimps, prawns, small crabs, and fishes dropped before them. As soon as they are able to walk about, they cluster together in the manner of the young of the Common Gannet, and it is really marvellous how the

parents can distinguish them individually on such occasions. This bird walks in the manner of the Terns, with short steps, and the tail slightly elevated. When gorged and fatigued, both old and young birds are wont to lie flat on the sand, and extend their bills before them; and when thus reposing in fancied security, may sometimes be slaughtered in great numbers by the single discharge of a gun. When shot at while on wing, and brought to the water, they merely float, and are easily secured. If the sportsman is desirous of obtaining more, he may easily do so, as others pass in full clamour close over the wounded bird.

BLACK SKIMMER OR SHEAR-WATER, *Rhynchops nigra*, Wils. Amer. Orn., vol. vii. p. 85.
RHINCOPS NIGRA, Bonap. Syn., p. 352.

BLACK SKIMMER, Nutt. Man., vol. ii. p. 264.

BLACK SKIMMER OR RAZOR-BILLED SHEAR-WATER, *Rhynchops nigra*, Aud. Orn. Biog., vol. iv. p. 203.

Male, 20, 48. Female, $16\frac{3}{4}$, $44\frac{1}{2}$.

During winter, in vast multitudes on the coast of Florida. In summer dispersed in large flocks from Texas to New Jersey, breeding on sand beaches or islands. In the evenings and at night ascends streams sometimes to the distance of one hundred miles.

Adult Male.

Bill longer than the head, nearly straight, tetragonal at the base, suddenly extremely compressed, and continuing so to the end. Upper mandible much shorter than the lower, its dorsal outline very slightly convex, its ridge sharp, the sides erect, more or less convex, the edges approximated so as to leave merely a very narrow groove between them; the tip a little rounded when viewed laterally. Nasal groove rather short, narrow near the margin; nostrils linear-oblong, sub-basal in the soft membrane. Lower mandible with the angle extremely short, the dorsal outline straight or slightly decurved, the sides erect, the edges united into a very thin blade which fits into the narrow groove of the upper mandible, the tip rounded or abrupt when viewed laterally.

Head rather large, oblong, considerably elevated in front. Neck short and thick. Body short, ovate, and compact. Feet short, moderately stout; tibia bare below, with narrow transverse scutella before and behind; tarsus short, moderately compressed, anteriorly covered with broad scutella, reticulated on the sides and behind; toes very small; the first extremely short, and free; the inner much shorter than the outer, which is but slightly exceeded by the middle toe; the webs very deeply concave at the margin, especially the inner. Claws long, compressed, tapering, slightly arched, rather obtuse, the inner edge of the middle toe dilated and extremely thin. Plumage

moderately full, soft, and blended; the feathers oblong and rounded. Wings extremely elongated, and very narrow; the primary quills excessively long; the first longest, the rest rapidly graduated; the secondaries short, broad, incurved, obliquely pointed, some of the inner more elongated. Tail rather short, deeply forked, of twelve feathers, disposed in two inclined planes.

Bill of a rich carmine, inclining to vermilion for about half its length, the rest black. Iris hazel. Feet of the same colour as the base of the bill, claws black. The upper parts are deep brownish-black; the secondary quills, and four or five of the primaries, tipped with white; the latter on their inner web chiefly. Tail-feathers black, broadly margined on both sides with white, the outer more extensively; the middle tail-coverts black, the lateral black on the inner and white on the outer web. A broad band of white over the forehead, extending to the fore part of the eye; cheeks and throat of the same colour; the rest of the neck and lower parts in spring and summer of a delicate cream-colour; axillary feathers, lower wing-coverts, and a large portion of the secondary quills, white; the coverts along the edge of the wing black.

Length from point of upper mandible to end of tail 20 inches, to end of wings $24\frac{1}{2}$, to end of claws 17; to carpal joint $8\frac{1}{4}$; extent of wings 48; upper mandible $3\frac{1}{8}$; its edge $3\frac{7}{8}$; from base to point of lower mandible $4\frac{1}{2}$; depth of bill at the base 1; wing from flexure $15\frac{3}{4}$; tail to the fork $3\frac{1}{2}$; to end of longest feather $5\frac{1}{4}$; tarsus $1\frac{1}{4}$; hind toe and claw $\frac{4}{12}$; middle toe $\frac{10}{12}$, its claw $\frac{4}{12}$. Weight 13 oz.

The Female, which is smaller, is similar to the male, but with the tail-feathers white, excepting a longitudinal band including the shaft.

Length to end of tail $16\frac{3}{4}$, to end of wings $20\frac{1}{4}$, to end of claws $16\frac{1}{4}$, to carpus 8; extent of wings $44\frac{1}{2}$. Weight 10 oz.

After the first autumnal moult there is on the hind part of the neck a broad band of white, mottled with greyish-black; the lower parts pure white, the upper of a duller black; the bill and feet less richly coloured.

Length to end of tail, $16\frac{3}{4}$ inches, to end of wings 20, to end of claws $14\frac{1}{2}$, to carpus $6\frac{3}{8}$; extent of wings 42.

In some individuals at this period the mandibles are of equal length.

The palate is flat, with two longitudinal series of papillæ directed backwards. The upper mandible is extremely contracted, having internally only a very narrow groove, into which is received the single thin edge of the lower mandible. The posterior aperture of the nares is $1\frac{3}{12}$ inches long, with a transverse line of papillæ at the middle on each side, and another behind. The tongue is sagittiform, $6\frac{1}{2}$ twelfths long, with two conical papillæ at the base, soft, fleshy, flat above, horny beneath. Aperture of the glottis $4\frac{1}{2}$ twelfths long, with numerous small papillæ behind. Lobes of the

liver equal, $1\frac{1}{2}$ inches long. The heart of moderate size, $1\frac{1}{2}$ long, 10 twelfths broad.

The œsophagus, of which only the lower portion, *a*, is seen in the figure, is 8 inches long, gradually contracts from a diameter of 1 inch to 4 twelfths, then enlarges until opposite the liver, where its greatest diameter is $1\frac{4}{12}$. Its external transverse fibres are very distinct, as are the internal longitudinal. The proventriculus, *b*, is 9 twelfths long, its glandules extremely small and numerous, roundish, scarcely a quarter of a twelfth in length. The stomach, *c*, *d*, *e*, is rather small, oblong, 1 inch 4 twelfths long, 11 twelfths broad, muscular, with the lateral muscles moderate. The cuticular lining of the stomach is disposed in nine broad longitudinal rugæ of a light red colour, as in the smaller Gulls and Terns. Its lateral muscles are about 4 twelfths thick, the tendons, *e*, 6 twelfths in diameter. The intestine is 2 feet 4 inches long, its average diameter $2\frac{1}{2}$ twelfths. The rectum is 2 inches long. One of the cœca is 4, the other 3 twelfths, their diameter $1\frac{1}{4}$ twelfths.

In another individual, the intestine is $22\frac{3}{4}$ inches long; the cœca 5 twelfths long, 1 twelfth in diameter; the rectum $1\frac{3}{4}$ inches long; the cloaca 9 twelfths in diameter.

The trachea is $5\frac{3}{4}$ inches long, round, but not ossified, its diameter at the top 5 twelfths, contracting gradually to $2\frac{1}{2}$ twelfths. The lateral or contractor muscles are small; the sterno-tracheal slender; there is a pair of inferior laryngeals, going to the last ring of the trachea. The number of rings is 90, and a large inferior ring. The bronchi are of moderate length, but wider, their diameter being $3\frac{1}{2}$ twelfths at the upper part; the number of their half-rings about 18.

The digestive organs of this bird are precisely similar to those of the Terns and smaller Gulls, to which it is also allied by many of its habits.

W. E.

Black Skimmer or Shearwater.

Male

Drawn from Nature by J. J. Audubon, F.R.S. F.L.S.

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